

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number
WO 2004/007425 A2

(51) International Patent Classification⁷: **C07C 209/00**

(21) International Application Number:
PCT/EP2003/006669

(22) International Filing Date: 25 June 2003 (25.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
102 31 119.6 10 July 2002 (10.07.2002) DE

(71) Applicant (for all designated States except US): **DE-GUSSA AG** [DE/DE]; Bennigsenplatz 1, 40474 Düsseldorf (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **JAEGER, Bernd** [DE/DE]; Mühlthalstrasse 9F, 64297 Darmstadt (DE). **HAAS, Thomas** [DE/DE]; Lersnerstrasse 30a, 60322 Frankfurt (DE). **STOCHNIOL, Guido** [DE/DE]; Hohes Ufer 19, 45721 Haltern (DE). **LETTMANN, Christian** [DE/DE]; Baderweg 88, 45259 Essen (DE). **HOFEN, Willi** [DE/DE]; Südring 54, 63517 Rodenbach (DE). **STADTMÜLLER, Klaus** [DE/DE]; Hemsbacherstrasse 3, 63755 Alzenau (DE). **LOTZ, Jörg** [DE/DE]; Landrückenstrasse 13, 36148 Kalbach (DE).

(74) Common Representative: **DEGUSSA AG**; Intellectual Property Management, Patente und Marken, Standort Hanau, Postfach 13 45, 63403 Hanau (DE).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,

GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- of inventorship (Rule 4.17(iv)) for US only

Published:

- without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR INCREASING THE SELECTIVITY OF THE HYDROGENATION OF 4,4'-DIAMINODIPHENYLMETHANE TO 4,4'-DIAMINODICYCLOHEXYLMETHANE IN THE PRESENCE OF AN N-ALKYL-4,4'-DIAMINODIPHENYLMETHANE

(57) Abstract: The invention relates to a process for increasing the selectivity of the hydrogenation of 4,4'-diaminodiphenylmethane (4,4'-MDA) to diaminodicyclohexylmethane (4,4'-HMDA) by catalytic hydrogenation of a mixture containing 4,4'-MDA as the main component and its mono-N-methyl derivative as a secondary component. According to the invention, the hydrogenation is terminated before a conversion of 4,4'-MDA to 4,4'-HMDA of 99% is achieved. Under these conditions, a substantially smaller proportion of the N-methyl-4,4'-MDA is hydrogenated to N-methyl-4,4'-HMDA.

WO 2004/007425 A2